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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,547	08/21/2003	Suresh Ramarajan	108298723US	9716
25096	7590	08/10/2005	EXAMINER	
PERKINS COIE LLP			WHITTINGTON, KENNETH	
PATENT-SEA			ART UNIT	
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DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/646,547

Applicant(s)

RAMARAJAN, SURESH

Examiner

Kenneth J. Whittington

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-28,31-42 and 44-51 is/are rejected.
- 7) ☒ Claim(s) 29,30 and 43 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


Bot Ledyh
Primary Examiner

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/8/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

6 A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12 Claims 1, 2, 9-12, 14, 15, 18-20, 25, 27, 34, 36-39, 41, 42, 44, 56, 50 and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Oguri et al. (US 6,409,576), hereinafter Oguri. Regarding claims 1, 2, 12, 14, 15, 21, 25, 27, 34, 39, 44 and 45, Oguri discloses a method and apparatus therefor for detecting the rotation state of a microfeature workpiece comprising:

18 means supporting the microfeature workpiece (See Oguri FIG. 2, supports 11), the workpiece having a first and second face and an edge surface and comprising a semiconductor substrate (See FIG. 2, item 1), the support supporting the edge surface of the workpiece (See FIG. 2); rotating the microfeature workpiece (Note that supports also rotate the workpiece);

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means for rotating and removing material from the workpiece with rotating brushes (See FIG. 2, items 12 and 13 and see FIG. 2 and col. 5, line 51 to col. 7, line 42);

means for establishing a magnetic field at least proximate to the microfeature workpiece which would require an electric potential to operate (See FIG. 2 and col. 7, lines 11-33, note element 21 emitting electro-magnetic radiation); and

detecting a change of a rotation speed of the microfeature workpiece by detecting a characteristic corresponding to a state of the magnetic field, the characteristic depending at least in part on relative motion, or lack of relative motion, between the conductive material of the microfeature workpiece and the magnetic field (See FIG. 2 and col. 7, lines 11-33).

Regarding claims 9, 10, 11, 18, 19, 20, 37, 38, 41, 42, 50 and 51 the method of Oguri discloses a means for ceasing to rotate the workpiece if a change of rotation speed exceeds a target value (See col. 7, lines 29-33); and

means for removing the workpiece from the support with the workpiece ceases to rotate (See col. 7, line 43 to col. 8, line 2 and col. 3, line 65 to col. 4, line 61, note that the primary cleaning process stops the rotation of the workpiece and the workpiece is thereafter moved to the next workstation).

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Regarding claims 36, the apparatus of Oguri has a control device for monitoring the rotational speed of the workpiece and directing control of the speed of the workpiece (See col. 7, line 11 to col. 8, line 7).

6

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

12

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

24

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

30

Claims 3, 13, 16, 28, 35 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oguri in view of

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Garshelis (US 5,367,257). Regarding claims 3, 28 and 46, Oguri teaches of an apparatus using a notch in the workpiece in conjunction with a light source. Garshelis teaches an alternative method for measuring the rotation of a conductive disk comprising placing a magnet and a magnetic detector

6 proximate a rotating conductive workpiece to detect the motion of the workpiece (See Garshelis FIG. 2, note rotating conductive workpiece 14, magnet 16, detector 18). It would have been obvious to use the motion detection apparatus of Garshelis in the cleaning apparatus of Oguri. One having ordinary skill in the art would have been motivated to do so to provide a simple
12 motion and velocity sensor that does not require the use of grooves or teeth in the target wheel and is able to operate with a smooth target wheel, and which is economical, accurate and reliable (See Garshelis col. 2, lines 6-14 and note the entire Disclosure of the Invention) and which is non-contact, small robust and low cost (See Garshelis col. 1, lines 34-40).

18 Regarding claims 13 and 35, Garshelis teaches measuring a variation in magnetic field using a magnetic sensor that is a force measuring device (See Garshelis col. 6, lines 31-33, note a Hall sensor).

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Claims 4-8, 16, 17, 23, 24, 26, 31-33 and 47-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oguri in view of Garshelis as applied to claims 1, 3, 25, 28, 44 and 46 above, and further in view of Cervantes et al. (US 6,538,433), hereinafter Cervantes. Regarding claims 4, 16, 23, 6 24, 26, 47 Oguri et al. in view of Garshelis teaches using a mounted magnet as a magnetic field generator and detecting the characteristic includes detecting a change in voltage in the circuit (See Garshelis FIG. 2, item 18, the Hall sensor provides such a voltage). However, this combination does not teach using an electromagnet. Cervantes teaches in lieu of the magnet, 12 using an electromagnet to produce the magnetic field (See Cervantes et al. col. 2, line 60 to col. 3, line 9). It would have been obvious at the time the invention was made to use the electromagnet in lieu of a magnet. One having ordinary skill would have been motivated to do so because such devices are well known equivalents in the art for providing a constant magnetic 18 field as explicitly taught by Cervantes (See same paragraph), as long as a constant voltage and current are applied to the coil in the electromagnet coil in the electromagnet circuit.

Regarding claims 5 and 17, Garshelis teaches alternately using a coil in lieu of the Hall sensor for detecting a magnetic field (See Garshelis col. 1, lines 34-64). It would have been

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obvious at the time the invention was made to use a coil because it is well known in the art that using Hall, MR or coil sensors are art recognized equivalents for measuring a magnetic field, as is noted by Garshelis (See same paragraph). Furthermore, a coil measures the magnetic field by measuring the current induced in the coil, thus the magnetic field would be measured by detecting a change in current flowing in the electromagnetic circuit.

Regarding the claims 6-8, 31-33, 48 and 49, Oguri in view of Garshelis teaches using a mounted magnetic in association with a magnetic field sensor in a motion sensor. However, this combination does not teach a movable magnetic member or radiation/light sensor arrangements. Cervantes teaches a speed or motion sensor for detecting the relative movement between a metallic bed and a sensor arrangement (See Cervantes col. 1, lines 54-64), the sensor arrangement comprising a movable magnet on a non-rigid support and a laser radiation (light) means and sensor (See FIG. 2, items 30, 28 and 36) for detecting the movement of the magnet, indicative of the motion between the sensor and the bed (See col. 6 line 56 to col. 7, line 57). It would have been obvious at the time the invention was made to use the sensor arrangement of Cervantes in the apparatus disclosed by the combination of Oguri in view of Garshelis. One

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having ordinary skill in the art would have been motivated to do so to provide a sensor arrangement that is small and simple and which is easy to adapt to various applications and environments (See Cervantes col. 1, lines 54-64).

6 Claims 22 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oguri in view of Krupa et al. (US 6,678,911), hereinafter Krupa. Oguri et al. teaches the features of claims 21 and 39 as discussed above. Furthermore, Oguri teaches a brush device with an associated rotating brush and a detection device. However, Oguri does not explicitly
12 teach the controller, brush and driver arrangement as recited in claims 22 and 40. Krupa teaches a wafer cleaning apparatus comprising a drive device for the brush assembly (see Krupa FIGS. 1 and 2, note brushes 21a, 21b and drive systems associated therewith) and a feedback control device coupled between the detection device and the rotating brush device (note
18 that the control monitors the speed and controls motors for brushes, see col. 6, lines 48-67), the control controlling the rotation speed of the workpiece (See same paragraphs and see FIG. 6, items controller 61 with connection to drive motor 113 for the workpiece). Furthermore, the controller controls the operation based on parameters measured, such as speed, it varies

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operational parameters, such as brush pad velocity and pressure for particular cleaning operations (See col. 6, lines 20-67).

It would have been obvious at the time the invention was made to used the control and cleaning processes as taught by Krupa in the apparatus of Oguri. One having ordinary skill in the art

6 would have been motivated to do so to provide an optimal cleaning operation for any particular workpiece (See same paragraphs of Krupa).

Allowable Subject Matter

Claims 29, 30 and 43 are objected to as being dependent
12 upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 29, the prior art does not teach the
18 detection device including a voltmeter electrically coupled to the electromagnet, in combination with the other features of the claim.

Regarding claim 30, the prior art does not teach the detection device including an ammeter coupled to the

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electromagnet, in combination with the other features of the claims.

Regarding claim 43, the prior art does not teach a ceasing of the rotation of the workpiece when the rotation still exceeds a speed change threshold following a prior speed change measurement and speed adjustment, in combination with the other features of the claims.

Conclusion

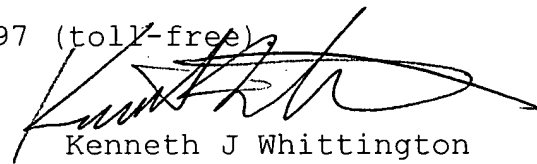
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, namely, various wafer cleaning apparatus and speed detection devices based on the eddy current principle.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Whittington whose telephone number is (571) 272-2264. The examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kenneth J Whittington
Examiner
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